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(54) Title: A DEVICE FOR REMOTE CONTROL OF A COMPUTER BY RADIO

(57) Abstract

A device for remotely displaying information from a monitor of a main computer and for remotely and fully controlling the main computer. The device of the present invention includes a remote A/V display device and a remote input platform. The remote input platform has a radio transmitter and the remote A/V display device has a radio receiver for communicating with the main computer, which is in communication with a corresponding radio transmitter and a corresponding radio receiver. The main computer sends audio and video signals through the radio transmitter for displaying information, preferably in the form of a GUI (graphical user interface), on the remote A/V display device. Preferably, the information also includes streaming video and/or graphics, as well as streaming sound. Similarly, the main computer receives input instructions by the radio receiver from the user through the remote input platform. Only the main computer has a CPU, although either or both of the remote A/V display device and the remote input platform may have a microprocessor or other processor. Thus, the portions of the computer with which the user directly interacts, the A/V display device and the input platform, can be remote devices, potentially physically separated from the main portion of the main computer (including the CPU).

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A DEVICE FOR REMOTE CONTROL OF A COMPUTER BY RADIO

FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to a non-network device for direct remote control of a main computer, and in particular, to a system in which the non-network device features a remote monitor and speakers which directly display the visual and audio display of the main computer, and in which the device features a remote input platform for sending instructions directly to the main computer.

Computers are becoming more popular as home entertainment devices and for the organization and display of information for the consumer. In addition to the functions of earlier computers, computers today can play music stored in a variety of formats, including files stored in the MP3 format on a CD, on magnetic storage medium or on the DVD storage medium, as well as displaying video streams and enabling "chats" to take place through the Internet. In addition, consumers can now perform a variety of tasks "on-line" through the computer, such as order groceries from the local supermarket, which are then delivered to the house of the consumer. These applications have the advantage of being more efficient and of saving the consumer time.

The computer itself has been sufficiently adapted for the household environment and for the new multi-media tasks, except for portability. The typical household computer is a "desktop" computer which is not very portable. However, certain applications such as playing and managing a musical database or otherwise interacting with the computer from a remote location would be more efficient if the computer could easily be moved from room to room. Thus, desktop computers are not sufficiently portable for such tasks.

A more useful solution would enable the consumer to view the display of the monitor of the computer and to interact with the computer anywhere in the house, as a remote application. The entire computer would not need to be moved about from room to room, but only those portions which are required for controlling the computer and for displaying information on the monitor. Unfortunately, those remote computing solutions which are available only enable partial control, and do not permit portions of the computer to be operated in a fully remote and independent fashion, while still remaining tied to the CPU of the computer but without an additional network connection.

Therefore, there is an unmet need for, and it would be highly useful to have, a device for

remote display of information on a monitor and for remotely controlling a computer, as though the user was in physical proximity to the computer.

SUMMARY OF THE INVENTION

The present invention is of a device for remotely displaying the audiovisual information of a main computer and for remotely and fully controlling the functions of the main computer. The device of the present invention includes a remote A/V (audiovisual) display device and a remote input platform. The remote input platform has a radio transmitter and the remote A/V display device has a radio receiver for communicating with the main computer, which is in communication with the corresponding radio transmitter and radio receiver. The main computer sends audiovideo signals through the radio transmitter for displaying information, preferably in the form of a GUI (graphical user interface), on the remote A/V display device. Preferably, the information also includes streaming video and/or graphics. Similarly the main computer receives input instructions by the radio receiver from the user through the remote input platform. Only the main computer has a CPU, although either or both of the remote A/V display device and the remote input platform may have a microprocessor or other processor. Thus, the portions of the computer with which the user directly interacts, the display device and the input platform, can be remote devices, potentially physically separated from the main portion of the main computer (including the CPU).

According to the present invention, there is provided a remote display device for remote interaction by a user with a main computer, the main computer being in communication with a main transmitter and a main receiver, the main computer featuring a local video card and the main computer featuring a local input port for receiving input instructions, the device comprising: (a) a remote display device for receiving display signals directly from the local video card through the main transmitter and for displaying a display to the user, the display being at least a visual display, the remote display device featuring a remote receiver for receiving the display signals; and (b) a remote input platform for receiving input data from the user and for transmitting the input data directly to the local input port of the main computer through the main receiver, the remote input platform featuring a remote transmitter for transmitting the input data to the main receiver; such that the device lacks a CPU (central processing unit) and such that only the main computer has the CPU.

According to another embodiment of the present invention, there is provided a system for remote interaction with a user, comprising: (a) a main computer, the main computer featuring a CPU, the main computer comprising: (i) a main radio transmitter for transmitting radiowaves and a main receiver for receiving radiowaves; (ii) a plurality of video cards, including at least a first video card being locally connectable; and (iii) an operating system capable of controlling the plurality of video cards substantially simultaneously; (b) a remote display device for receiving display signals from a second of the plurality of video cards through the main transmitter of the main computer and for displaying a visual display to the user, the remote display device featuring a remote radiowave receiver for receiving the display signals, the remote display device lacking a CPU; and (c) a remote input platform for receiving input data from the user and for transmitting the input data to the main computer, the remote input platform featuring a remote radiowave transmitter for transmitting the input data, the remote input platform lacking a CPU.

Hereinafter, the term "computing platform" refers to a particular computer hardware system or to a particular software operating system. Examples of such hardware systems include, but are not limited to, personal computers (PC), palmtops, handheld computers, Macintosh ™ computers, mainframes, minicomputers and workstations. Examples of such software operating systems include, but are not limited to, UNIX, VMS, Linux, MacOS™, DOS, one of the Windows™ operating systems by Microsoft Corp. (USA), including Windows NT™, Windows 3.x™ (in which "x" is a version number, such as "Windows 3.1™"), Windows CE™, Windows95™, and Windows98™, as well as any suitable operating system for embedded units or palmtop/handheld type computers.

For the present invention, a software application could be written in substantially any suitable programming language, which could easily be selected by one of ordinary skill in the art. The programming language chosen should be compatible with the computing platform according to which the software application is executed. Examples of suitable programming languages include, but are not limited to, C, C++ and Java.

In addition, the present invention could be implemented as software, firmware or hardware, or as a combination thereof. For any of these implementations, the functional steps performed by the method could be described as a plurality of instructions performed by a data processor.

Hereinafter, the term "CPU" (central processing unit) includes those portions of the computer which control the remainder of the computer, including the peripherals. As defined

herein, the CPU includes the control unit and the arithmetic and logic unit (ALU), as well as other components such as memory and temporary buffers which are required for the operation of the control unit and the ALU. Other types of microprocessors or data processors are specifically excluded from the term "CPU" as herein defined.

Hereinafter, the term "speaker" is defined to include any type of device for producing an audible sound stream for a user, including an earphone.

Hereinafter, a "locally connectable" video card is a video card which is capable of controlling a monitor or other display device which is attached to the computer in which the video card is located, regardless of whether the computer actually has such a monitor or other display device attached.

Hereinafter, the term "portable computer" refers to any device which is capable of displaying computer graphics, such as VGA, SVGA or XGA graphics for example, as well as audio data; which has a serial or parallel data input such as a RS232 Firewire port, a USB port , a TCP/IP port, a PCMCIA card, or a BUS-CARD for example; and which has I/O components such as a microphone, and/or a keyboard, and/or a pointing device. Such a device could be a notebook, sub-notebook, Jupiter device, or a palmtop, for example. A Firewire port and a USB port are both examples of serial interfaces.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1 is a schematic block diagram illustrating an exemplary device and system according to the present invention;

FIG. 2 is a schematic block diagram illustrating an exemplary wireless multimedia platform monitor according to the present invention;

FIGS. 3A-3C are schematic block diagrams which illustrate three different embodiments of a complete wireless system according to the present invention; and

FIG. 4 is a schematic block diagram illustrating a preferred implementation of a cordless platform according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is of a device for remotely displaying information from a monitor

of a main computer and for remotely and fully controlling the main computer. The device of the present invention includes a remote A/V display device and a remote input platform. The remote input platform has a radio transmitter and the remote A/V display device has a radio receiver for communicating with the main computer, which is in communication with a corresponding radio transmitter and a corresponding radio receiver. The main computer sends audio and video signals through the radio transmitter for displaying information, preferably in the form of a GUI (graphical user interface), on the remote A/V display device.

Preferably, the information also includes streaming video and/or graphics, as well as streaming audio.

Similarly, the main computer receives input instructions by the radio receiver from the user through the remote input platform. Only the main computer has a CPU, although either or both of the remote A/V display device and the remote input platform may have a microprocessor or other processor. Thus, the portions of the computer with which the user directly interacts, the A/V display device and the input platform, can be remote devices, potentially physically separated from the main portion of the main computer (including the CPU).

The principles and operation of the device according to the present invention may be better understood with reference to the drawings and the accompanying description.

Referring now to the drawings, Figure 1 is a schematic block diagram illustrating an exemplary device and system according to the present invention. A system **10** includes a remote interaction device **12** for interaction with the user of a main computer **14**. Remote interaction device **12** is preferably able to communicate with main computer **14** through radiowave communication. Preferably, remote interaction device **12** receives power through a battery which is optionally chargeable at a charger/base **16**.

Remote interaction device **12** features a remote A/V display device **18** preferably for displaying both audio and visual data, although remote A/V display device **18** could optionally display only audio or only visual data. Hereinafter, the term "display" can include both a visual and an audio display. Remote A/V display device **18** preferably includes an ISM band receiver **20** for receiving radiowave communication from main computer **14**. More preferably, all of the radiowave receivers and transmitters of the present invention operate as low-frequency radiowaves, most preferably in the range of from about 2.4 GHz to about 5.8 GHz, as this range does not require a special license in the United States of America. In addition, remote A/V display device **18** preferably also features a video expander **22** for expanding the compressed

video signals for display on a screen **24**. The type of video expander **22** and the type of screen **24** would depend upon the type of remote A/V display device **18** and could easily be selected by one of ordinary skill in the art. Examples of screen **24** include but are not limited to any type of flat screen including a plasma screen or an LCD (liquid crystal display), a CRT (cathode ray tube) monitor, a computer monitor or any other type of video display monitor. Thus, remote A/V display device **18** enables visual data such as a GUI (graphical user interface), other graphics or images, or a video stream, to be displayed to the user.

Optionally and preferably, remote A/V display device **18** includes an audio amplifier **26** and at least one, but preferably two speakers **28** as shown. Also optionally and preferably, remote A/V display device **18** features earphones **30**. The audio data is received by ISM band receiver **20** which is also connected to audio amplifier **26**. Audio amplifier **26** then renders the audio data into an audio stream for an audio display to the user. Thus, these preferred components enable remote A/V display device **18** to play music or to otherwise render an audio stream audible to the user.

In addition, remote interaction device **12** also features a remote input platform **32**. Remote input platform **32** enables information and instructions to be entered by the user. Remote input platform **32** includes an ISM band SP^2 (the term "SP^2" refers to spread-spectrum) transmitter **34** for transmitting radiowaves to main computer **14** in order to communicate the information and instructions from the user. As shown, remote input platform **32** optionally and preferably includes a number of different input components for accepting input from the user. For example, remote input platform **32** optionally and preferably includes a keyboard **36** for entering textual or other character-based input.

Remote input platform **32** optionally and preferably also includes a pointing device **38** such as a mouse, trackball, touchpad, touch-sensitive screen or other pointing device, in order for the user to be able to select a command or other input from the GUI preferably displayed by remote A/V display device **18**. Keyboard **36** and pointing device **38** are particularly preferred because these two input devices are typical of most home computers and as such are familiar to the user. Thus, remote A/V display device **18** and remote input platform **32** could be one physical unit or else two physically separated components.

In addition, remote input platform **32** also optionally and preferably includes a joystick port **40**, for example for receiving a joystick for playing electronic games. Remote input platform **32** also optionally and preferably includes a microphone **42** for receiving voice-based instructions

or for recording the voice of the user on main computer **14**, for example.

Thus, remote input platform **32** enables the user to input data, such as information and commands, which are then transmitted by radiowaves through ISM band SP^2 transmitter **34** to main computer **14**. Main computer **14** then sends signals for video display to remote A/V display device **18**, which receives these signals through ISM band receiver **20**. The components of main computer **14** which enable main computer **14** to both control the display on remote A/V display device **18** and to respond to data input through remote input platform **32** are as follows.

Main computer **14** preferably includes a video display card **44** which is connected to an A/V compressor **46** for compressing the video data, both of which are preferably located within a main computer box **13**. Main computer **14** sends display instructions for displaying video information on remote A/V display device **18** to video display card **44**. Video display card **44** then renders the instructions as video display signals suitable for a monitor such as screen **24**. The signals are then compressed by A/V compressor **46**. After compression, the signals are sent as radiowaves by an ISM band SP^2 transmitter **48**. The transmitted radiowaves are then received by ISM band receiver **20**, expanded by video expander **22** and displayed by screen **24** as previously described.

Optionally, main computer **14** could include a sound card **50** for receiving display signals for "displaying" (making audible) audio information on remote A/V display device **18**. Sound card **50** would then render these display signals into audio signals suitable for audio amplifier **26**. The audio signals would then be passed to ISM band SP^2 transmitter **48** through a "line out" port **52** on sound card **50**.

Main computer **14** also includes a joystick port **54** for receiving input from a joystick; a keyboard port **56** for receiving input from a keyboard such as remote keyboard **36**; and a pointing device port **58** for receiving input from a pointing device such as pointing device **38**. In addition, sound card **50** preferably includes a "line-in" or microphone port **59**. All of these ports receive input through an ISM band receiver **60** as shown, which could be located in charger/base **16** or alternatively could be located at main computer **14**.

Optionally and preferably, all of these ports also receive input from peripheral devices directly physically attached to main computer **14**. Therefore, main computer **14** preferably also includes a keyboard **62**, a monitor **64**, a joystick **66**, a pointing device **68** and a microphone **70** which are local peripheral devices. Thus, these local peripheral devices enable the user to operate main computer **14** locally.

In order for main computer **14** to be able to receive input data from both sets of peripheral devices, those attached locally such as keyboard **62**, and those in remote communication such as remote input platform **32**, preferably charger/base **16** also features a switching box **72**. Preferably, ISM band receiver **60** is also located at charger/base **16**. Switching box **72** receives the input data from ISM band receiver **60**, and then sends this data to the correct port on main computer **14**, such as keyboard port **56**, for example. Conversely, when input data is being received from a local peripheral device, such as keyboard **62** for example, switching box **72** then sends this input data to the correct port on main computer **14**, in this case keyboard port **56**. Thus, switching box **72** enables both local and remote peripherals to sequentially access main computer **14**.

In addition, in order for two different monitors to be controlled by main computer **14**, including both local monitor **64** and remote A/V display device **18**, preferably main computer **14** also features a second video display card **74**. Second video display card **74** receives instructions from main computer **14** for displaying video information, such as a GUI, on local monitor **64**. However, in order to accommodate this preferred embodiment of the present invention, main computer **14** must be operated by an operating system which is capable of controlling two monitors by controlling two video cards. An example of such an operating system is Windows 98™.

As its name implies, charger/base **16** also preferably features components for supplying power to remote A/V display device **18** and to remote input platform **32**. Preferably, power is supplied to both remote A/V display device **18** and remote input platform **32** through a rechargeable battery **76**, although each of remote A/V display device **18** and remote input platform **32** could have a separate battery power source. Charger/base **16** therefore preferably recharges rechargeable battery **76**, through an AC/DC power supply **78** and a remote DC charging socket **80**. AC/DC power supply **78** receives power from an AC supply **15**. Optionally and preferably, a remote charging plug (not shown) is located at remote interaction device **12** for connecting to remote DC charging socket **80** or to an external DC source (not shown). Thus, when battery-operated, remote A/V display device **18** and remote input platform **32** are preferably completely portable, such that neither requires a direct wire connection to an electrical socket.

Figure 2 is a schematic block diagram illustrating an exemplary wireless monitor according to the present invention, for displaying the multimedia data from the computer (not

shown), preferably including at least video data and audio data, and more preferably including video and audio data together. The wireless monitor is optionally and preferably used with the detached computers for decompressing the multimedia data according to the present invention, which include various components for compressing the data before transmission to the wireless monitor.

A wireless monitor **82** is connected to a radiofrequency (RF) transceiver **84**, which communicates with a main computer (not shown) through radiowave communication. Wireless monitor **82** preferably displays both audio and visual data, although wireless monitor **82** could optionally display only audio or only visual data. Hereinafter, the term "display" can include both a visual display and an audio display.

Wireless monitor **82** preferably includes an ISM band transceiver **86** for receiving radiowave communication from the main computer, and for transmitting such radiowave communication to the main computer. More preferably, all of the radiowave receivers and transmitters of the present invention operate as low-frequency radiowaves, most preferably in the range of from about 2.4 GHz to about 5.8 GHz, as this range does not require a special license in the United States of America.

ISM band transceiver **86** is preferably connected to a radiofrequency conversion interface **88**, for converting the radiowaves to video stream data. Preferably, conversion interface **88** converts the radiowaves to such video data in the MPEG format, although of course a different format could alternatively be used. The data is then decoded by a decoder **90**, which provides the video portion of the data to a display screen **92**. Optionally and preferably, display screen **92** receives this data through a DFP (digital flat panel display) port **94**. Also optionally and preferably, display screen **92** is a flat panel display, although of course other types of display screens could also be used. Examples of display screen **92** include but are not limited to any type of flat screen including a plasma screen or an LCD (liquid crystal display), a CRT (cathode ray tube) monitor, a computer monitor or any other type of video display monitor. Thus, wireless monitor **82** enables visual data such as a GUI (graphical user interface), other graphics or images, or a video stream, to be displayed to the user.

Decoder **90** also optionally and preferably provides the audio portion of the decoded data to a sound amplifier **96**. Sound amplifier **96** is connected to some type of audio playing device, such as a speaker **98**, an earphone socket **100**, or a line-out socket **102** as shown.

Preferably, wireless monitor **82** receives power through a battery which is optionally

chargeable at a charger/base (not shown), thereby enabling wireless monitor **82** to be portably transported for displaying video and/or audio data at various remote locations.

Figures 3A-3C are schematic block diagrams of exemplary configurations of wireless monitor **82** and a main computer for communicating with wireless monitor **82** of Figure 2 in order to provide the multimedia data, such as video and/or audio data for display by wireless monitor **82**. These configurations preferably compress multimedia data according to a compression method, such as MPEG for example. A particularly preferred compression method is briefly described in greater detail below.

The main computer can be described as including a multimedia data unit for preparing the multimedia data. Such a unit could include a video display card, for example, optionally with a software program for actually preparing the multimedia data itself, for example.

Figure 3A shows a first exemplary system **104** which is an internal implementation, in which the components of the multimedia compression system are contained within a main computer **106**. As shown, main computer **106** is connected to the wireless monitor (not shown) and to a local monitor **108**, which is optionally connected to main computer **106** with a cable. Main computer **106** features a video display card **110** with DVI (digital output) or DSP, which is connected to a video switch **112**. In the embodiment shown, video switch **112** is contained within main computer **106**, and is preferably connected to both local monitor **108** and to an MPEG encoder **114**, such that the video signals are either displayed locally, at local monitor **108**, or else are encoded for remote transmission by MPEG encoder **114**. For local display at local monitor **108**, preferably the signals are fed through a D/A converter **115**.

It should be noted that MPEG encoder **114**, which may be embodied as software, firmware or hardware, may encode the video data according to a different data format. MPEG encoder **114** optionally and preferably receives the video signals from an A/V-MPEG interface **134**, which is more preferably located on video display card **110**, and which converts the video signals from a format which is suitable for video display card **110** to a format which is suitable for MPEG encoder **114**.

MPEG encoder **114** also optionally and preferably receives audio input from an audio encoder **116**, which converts the audio data into a format which is readable by MPEG encoder **114**. MPEG encoder **114** then transmits the combined audio and video data to a converter **120**. Converter **120** converts the combined data into radiowaves, which are then transmitted by an

 transmitter **122** for transmitting radiowaves to the wireless monitor (not shown).

In addition, the audio data is passed as digital audio signals to a USB and/or Firewire output device driver **132**, which sends the audio data to a USB and/or Firewire port **118** for combining with the video data to converter **120**.

A system **124** shown in Figure 3B is similar to that of Figure 3A, except that the implementation is now external to main computer **106**, and a video display card **126** now has an analog RGB output directly to video switch **112**. Video switch **112** and the other multimedia compression and transmission components are now located at a separate base **129**, which is separate from main computer **106**.

Video switch **112** passes the analog video data to a video digitizer and converter **128**, which passes the data to A/V-MPEG interface **134**. MPEG interface **130** passes the data to MPEG encoder **114**, and from there to converter **120** and transceiver **122**, as previously described.

As for Figure 3A, the audio data is passed as digital audio signals to a USB and/or Firewire output device driver **132**, which sends the audio data to a USB and/or Firewire port **118** for combining with the video data at A/V-MPEG interface **134**.

Figure 3C shows a system **136** which is a second external implementation, in which the multimedia compression and transmission components are also located at separate base **129**. However, these components are now implemented for digital video signals, as for Figure 3A, rather than for the analog signals of Figure 3B.

Figure 4 is a schematic block diagram of an exemplary cordless platform according to the present invention. This implementation of the cordless platform has the advantage of being able to receive data from multiple sources, including from a source of TCP/IP packets, which is a standard type of data format for the transmission of data on networks.

In addition, the cordless platform of Figure 4 can be used as an "add-on" extension to existing portable computers, such as laptop and notebook computers, for example, in order to transform these existing portable computers into the portable unit of Figures 1 and 2, for example. For this implementation, the cordless platform of Figure 4 can be described as a sophisticated receiving device, with minimal data processing capabilities limited only to the decoding of the received display data which is received from the main computer, yet with the ability to receive and display video stream data, and optionally audio stream data, in a highly sophisticated and complex manner.

The interaction with such a portable computer could optionally be implemented as follows. The input signals from the portable are optionally transferred according to a protocol such as MPEG. The resultant MPEG stream is preferably decoded by the receiving device by software, by an external hardware decoder such as a PCMCIA card, or alternatively by a hardware device which connects to a Firewire or USB-2 input port.

As shown in Figure 4, a cordless platform **140** is connected to radiofrequency (RF) transceiver **84**, which communicates with a main computer (not shown) through radiowave communication, as for Figure 2, for example. Cordless platform **140** preferably includes ISM band transceiver **86** for receiving radiowave communication from the main computer, and for transmitting such radiowave communication to the main computer, as for Figure 2 above.

ISM band transceiver **86** is preferably in communication with a TCP/IP conversion interface **142** for converting the received data signal into data in the TCP/IP format. More preferably, such data includes video data which is compressed according to the MPEG2 compression method, as previously described. Such a conversion interface is preferred since TCP/IP is a standard data transmission protocol and data format for transmitting data in packet switched networks, for example. Alternatively, the conversion interface could be designed for a USB port and/or a Firewire port, as previously described for Figures 3A-3C above.

After conversion by TCP/IP conversion interface **142**, the data is passed to a microprocessor **144** such as a MediaGX™ processor for example. The MediaGX™ processor is an example of an advanced microprocessor system, which is a "computer on a chip", including the video display circuit, the audio production circuit, and the I/O interfaces in the chip. Next, the encoded data is decoded by a suitable decoder **146**, which is preferably an MPEG software decoder for the preferred implementation in which the received video stream data is encoded according to the MPEG compression method. The decoded data is then passed to a video display **148** for displaying the video data, and to a sound amplifier **150** for displaying the audio data. Video display **148** is preferably a flat panel display.

The audio data is preferably amplified by sound amplifier **150** for output by an audio data output device, such as speakers **152**, a line-out socket **154** and/or an earphone socket **156**.

An exemplary compression method for operation with the devices of Figures 1-4 is described in a U.S. Patent Application which was filed on November 12, 1999, incorporated by reference as if fully set forth herein. Briefly, the method of multimedia data compression which

is disclosed in that Application adjusts the compression method according to the type of software application which generated the multimedia data, and hence according to the characteristics of the data itself. Preferably, the type of multimedia data compression is selected by a profile manager, which detects the characteristics of the multimedia data to determine the profile of the data, and then which selects the multimedia data compression method according to the profile.

With regard to the implementations of Figures 1-4, the data which is to be sent to the portable, remote units is preferably compressed according to a suitable video compression method before transmission decompression and display, for example by the remote A/V display of Figure 1, or the remote monitor of Figure 2, and by the systems of Figures 3A-3B. Thus, the selection of compression profiles preferably enables the efficient compression of data which is to be transmitted to the portable, remote units for viewing by the user.

Therefore, the device of the present invention provides complete interactivity with a main computer at a remote location, without requiring a network card and without a physical wire or cable connection. The interactivity is provided through a remote A/V display device and a remote input platform, both of which lack a CPU. Thus, the main computer controls the actions of the remote A/V display device according to instructions received from the remote input platform.

While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made.

WHAT IS CLAIMED IS:

1. A remote display device for remote interaction by a user with a main computer, the main computer being in communication with a main transmitter and a main receiver, the main computer featuring a local video card and the main computer featuring a local input port for receiving input instructions, the device comprising:

(a) a remote display device for receiving display signals directly from the local video card through the main transmitter and for displaying a display to the user, said remote display device featuring a remote receiver for receiving said display signals to form received signals; and

(b) a remote input platform for receiving input data from the user and for transmitting said input data directly to the local input port of the main computer through the main receiver, said remote input platform featuring a remote transmitter for transmitting said input data to the main receiver;

such that the device lacks a CPU (central processing unit) and such that only the main computer has said CPU.

2. The device of claim 1, wherein said remote receiver and the main receiver are both radiowave receivers.

3. The device of claim 2, wherein said radiowave receiver receives radiowaves in a range of from about 2.4 GHz to about 5.8 GHz.

4. The device of claim 3, wherein said radiowave receiver is an ISM band receiver.

5. The device of claim 1, wherein said remote transmitter and the main transmitter are both radiowave transmitters.

6. The device of claim 5, wherein said radiowave transmitter transmits radiowaves in a range of from about 2.4 GHz to about 5.8 GHz.

7. The device of claim 1, wherein said display is at least a visual display, and

wherein said remote display device further comprises:

(i) a video expander for receiving said display signals from said remote receiver and for expanding said display signals to produce expanded signals; and

(ii) a screen for displaying said display signals according to said expanded signals from said video expander.

8. The device of claim 7, wherein said screen is selected from the group consisting of a plasma screen, a LCD (liquid crystal display) screen and a CRT (cathode ray tube) screen.

9. The device of claim 7, wherein said display is at least an audio display and said remote display device further comprises:

(iii) an audio amplifier for amplifying audio signals from said remote receiver; and

(iv) a speaker for audibly displaying said audio display to the user according to said audio signals received from said audio amplifier.

10. The device of claim 1, wherein said remote input platform further comprises a remote keyboard and a remote pointing device.

11. The device of claim 10, wherein said remote input platform further comprises a joystick port.

12. The device of claim 11, wherein said remote input platform further comprises a microphone.

13. The device of claim 1, wherein said remote display device further comprises:

(ii) a conversion interface for converting said received signals to an encoded multimedia data format;

(iii) a decoder for decoding said encoded multimedia data format to at least decoded video data; and

(iv) a display screen for displaying said decoded video data.

14. The device of claim 13, wherein said encoded multimedia data format is a MPEG

format.

15. The device of claim 14, wherein said display screen is selected from the group consisting of a plasma screen, an LCD (liquid crystal display), a CRT (cathode ray tube) monitor, a computer monitor and a video display monitor.

16. The device of claim 14, wherein said decoder also decodes said encoded multimedia data format to form decoded audio data, the device further comprising:

(v) a sound amplifier for receiving decoded audio data from said decoder and for amplifying said audio data; and

(vi) an audio playing device for playing said audio data from said sound amplifier.

17. A system for remote interaction with a user, comprising:

(a) a main computer, said main computer featuring a CPU, said main computer comprising:

(i) a main radio transmitter for transmitting radiowaves and a main receiver for receiving radiowaves;

(ii) a plurality of video cards, including at least a first video card being locally connectable; and

(iii) an operating system capable of controlling said plurality of video cards substantially simultaneously;

(b) a remote display device for receiving display signals from a second of said plurality of video cards through said main transmitter of said main computer and for displaying a visual display to the user, said remote display device featuring a remote radiowave receiver for receiving said display signals, said remote display device lacking a CPU; and

(c) a remote input platform for receiving input data from the user and for transmitting said input data to said main computer, said remote input platform featuring a remote radiowave transmitter for transmitting said input data, said remote input platform lacking a CPU.

18. The system of claim 17, wherein said main computer further comprises:

(iv) a local input device; and

(v) an input device port for receiving input data from said local input device and from said remote input platform;

and wherein the system further comprises:

(d) a switching box for switching said input data from said local input device and from said remote input platform to said input device port.

19. The system of claim 18, wherein said main computer features a main radiowave receiver for receiving radiowaves from said remote input platform.

20. The system of claim 18, wherein said switching box features a main radiowave receiver for receiving radiowaves from said remote input platform, said switching box passing said radiowaves to said main computer.

21. A multimedia data transmission system, comprising:

(a) a main computer, said main computer featuring a CPU, said main computer comprising:

(i) a main transmitter for transmitting a wireless signal; and

(ii) a multimedia data unit for preparing multimedia data;

(b) a multimedia data compression system for compressing said multimedia data received from said main computer to form compressed data, said compressed data being transmitted by said main transmitter; and

(c) a wireless monitor for receiving display signals from said main transmitter of said main computer, said wireless monitor comprising:

(i) a receiver for receiving said wireless signal from said main transmitter;

(ii) a decompression unit for decompressing said wireless signal to form display data; and

(iii) a display device for displaying said display data.

22. The system of claim 21, wherein said multimedia data compression system compresses said multimedia data according to an MPEG compression method.

23. The system of claim 22, wherein said multimedia data at least includes video stream data and said display device is for displaying video stream data.

24. The system of claim 23, wherein said display device is selected from the group consisting of a plasma screen, an LCD (liquid crystal display), a CRT (cathode ray tube) monitor, a computer monitor and a video display monitor.

25. The system of claim 23, wherein said multimedia data also includes audio stream data, said wireless monitor further comprising:

(iv) a sound amplifier for receiving said audio stream data and for amplifying said audio stream data; and

(v) an audio playing device for playing said audio stream data from said sound amplifier.

26. The system of claim 21, wherein said multimedia data compression system is located internal to said main computer, and wherein said multimedia data unit further comprises:

(1) a video display card for preparing video data; and

(2) a video switch;

and wherein said multimedia data compression system further comprises:

(1) a video data encoder for encoding said video data for transmission by said main transmitter, such that said video switch causes said video data to be alternately displayed locally at said main computer and passed to said video data encoder.

27. The system of claim 26, wherein said video data encoder encodes said video data according to an MPEG compression method, and wherein said decompression unit decodes said video data according to a MPEG decompression method.

28. The system of claim 27, wherein said video display card further comprises an A/V-MPEG interface for transforming said video data into an MPEG format.

29. The system of claim 21, wherein said multimedia data compression system is located external to said main computer, and wherein said multimedia data unit further comprises:

(1) a video display card for preparing video data; and

(2) a video switch;

and wherein said multimedia data compression system further comprises:

(1) a video data encoder for encoding said video data for transmission by said main transmitter, such that said video switch causes said video data to be alternately displayed locally at said main computer and passed to said video data encoder.

30. The system of claim 29, wherein said video data encoder encodes said video data according to an MPEG compression method, and wherein said decompression unit decodes said video data according to a MPEG decompression method.

31. The system of claim 30, wherein said video display card further comprises an A/V-MPEG interface for transforming said video data into an MPEG format.

32. The system of any of claims 21-31, wherein said video data is produced by said video display card as digital data.

33. The system of any of claims 21-31, wherein said video data is produced by said video display card as analog data, and wherein said multimedia data unit further comprises an analog to digital signal converter for converting said analog data to digital data.

34. A receiving device for remote interaction by a user with a main computer, the main computer being in communication with a main transmitter for transmitting a data signal, the main computer featuring a local video card, the receiving device operating in conjunction with a portable computer, the receiving device comprising:

(a) a receiver for receiving the data signal from the main transmitter to form received data;

(b) a TCP/IP data format conversion unit for converting said received data to TCP/IP data;

(c) a decoder for decoding said TCP/IP data to form decoded data; and

(d) a display device for displaying said decoded data.

35. The receiving device of claim 34, wherein said decoder decodes said TCP/IP data according to a MPEG decompression method at least to form video data, and wherein said display device displays said video data.

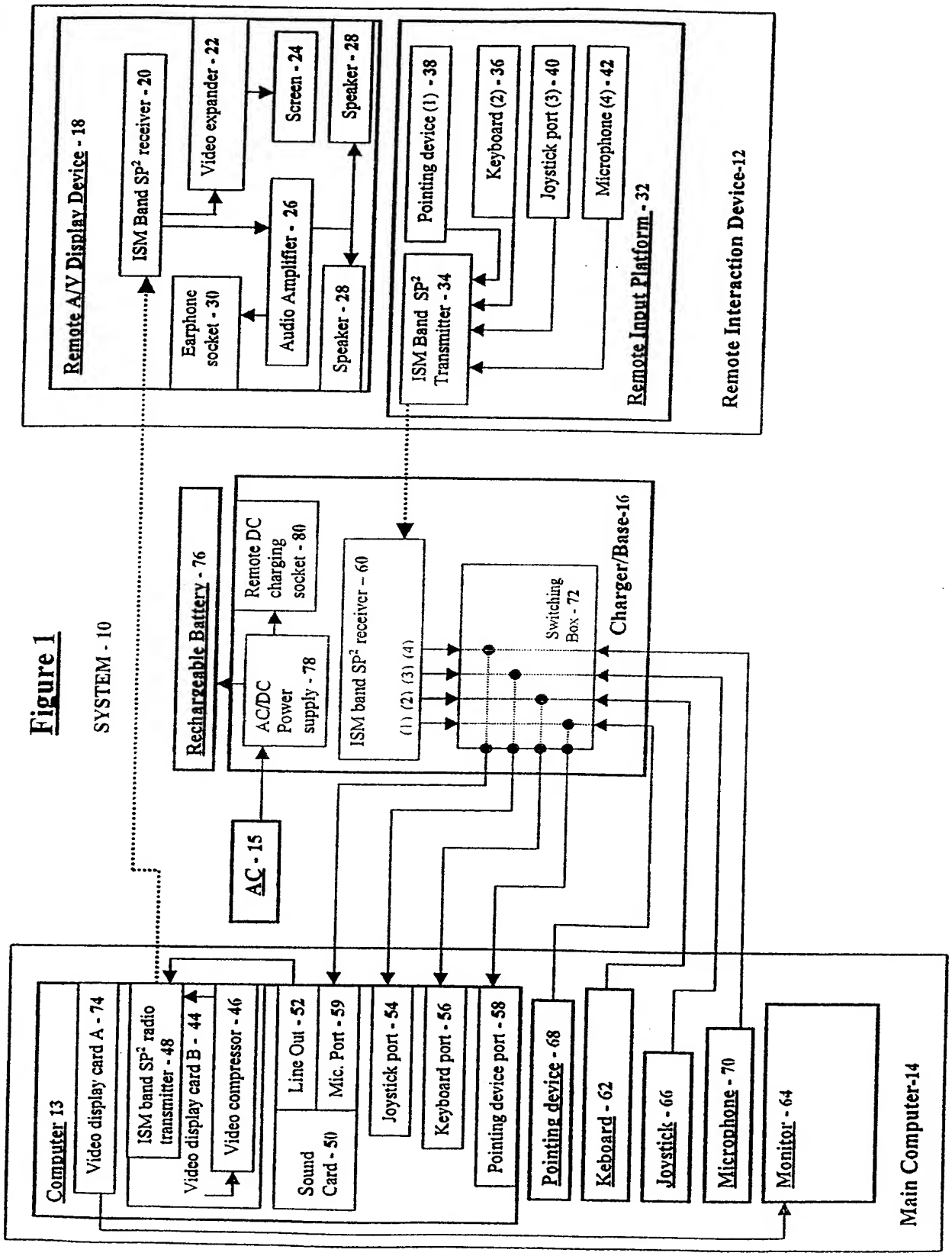

Figure 1

SYSTEM - 10

Figure 2

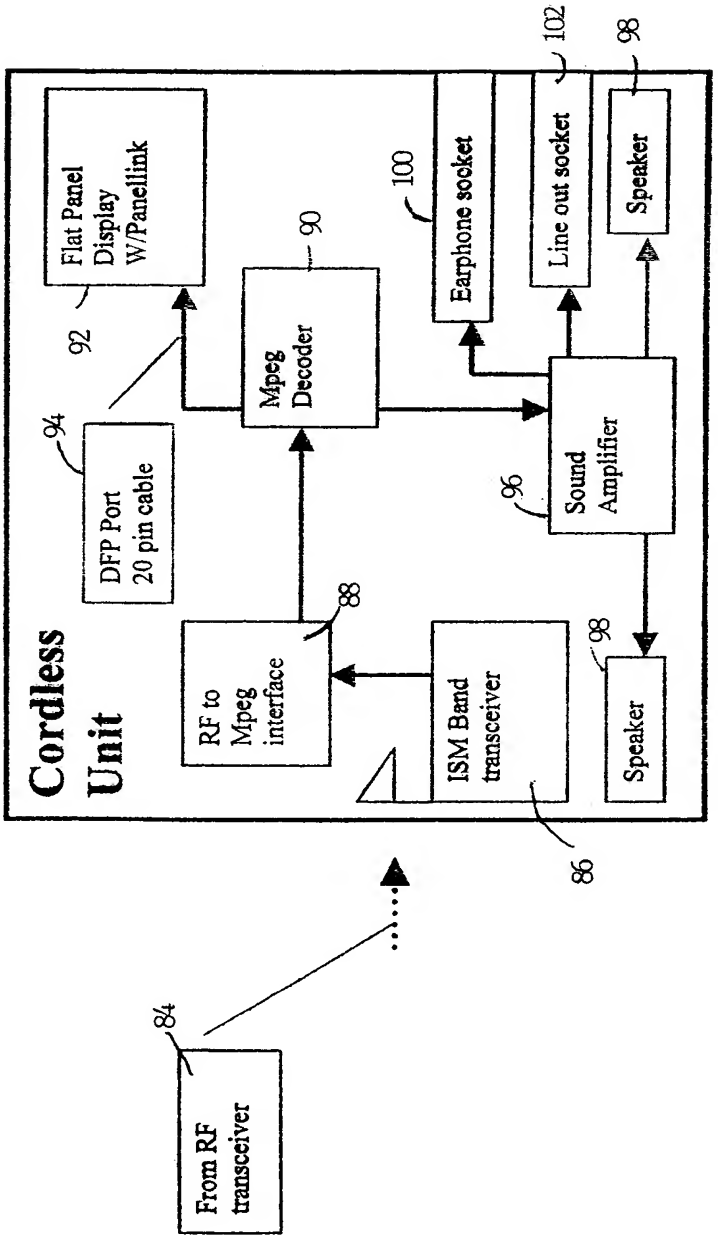
82
Cordless Unit
Flat Panel Display W/Panellink
92
DFP Port 20 pin cable
94
RF to Mpeg interface
88
Mpeg Decoder
90
ISM Band transceiver
86
Earphone socket
100
Sound Amplifier
96
Line out socket
102
Speaker
98
Speaker
98
From RF transceiver
84

Figure 3A

Internal implementation

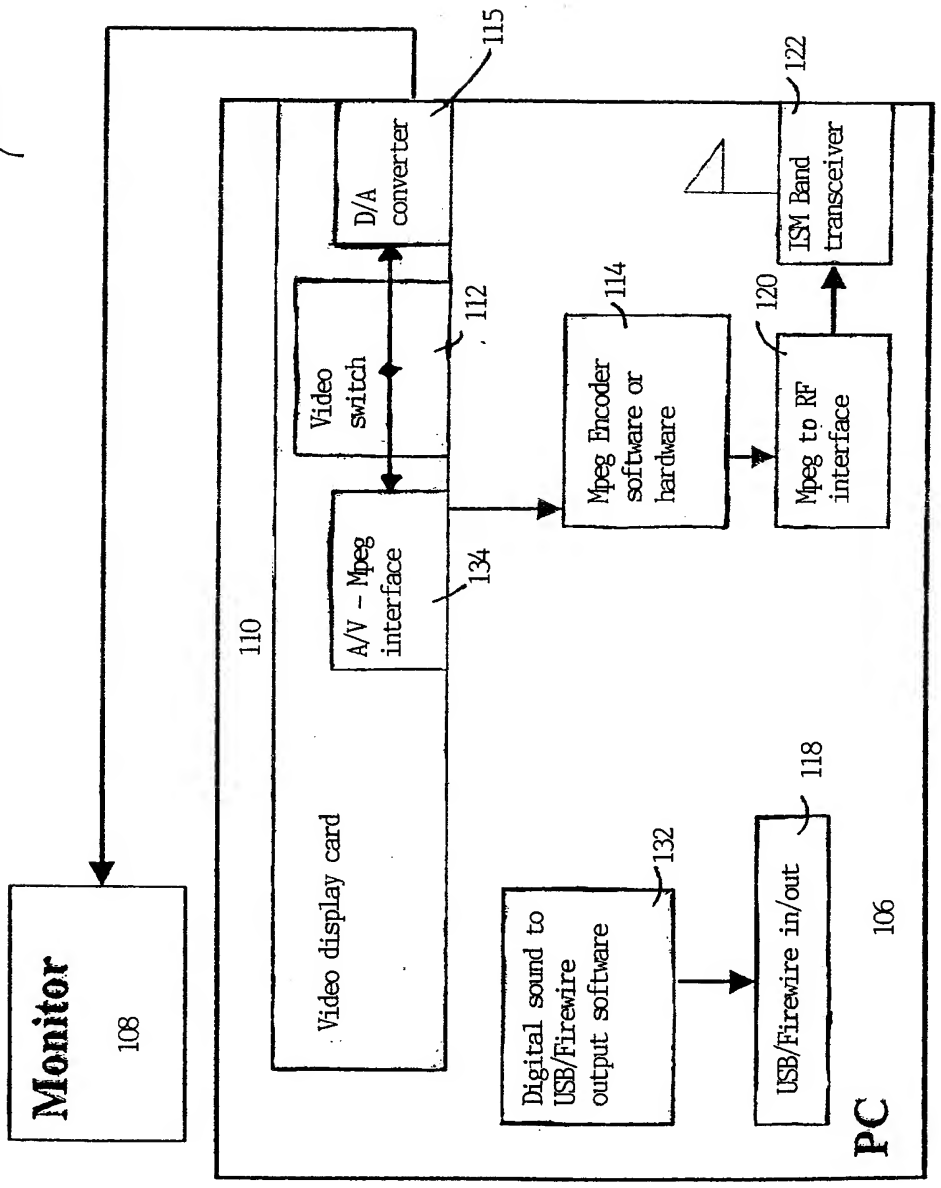

Figure 3B

External Analog RGB implementation

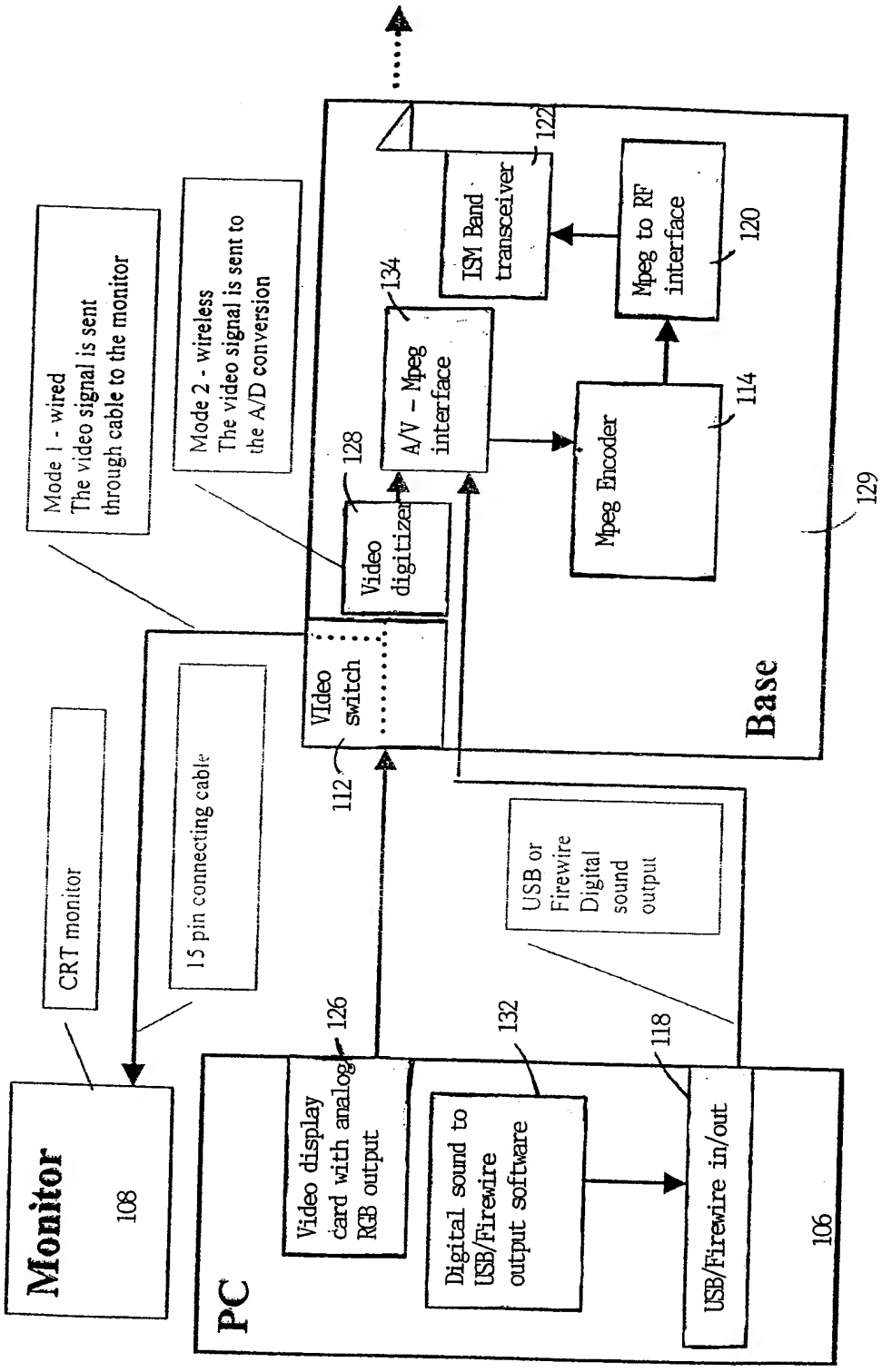

Figure 3C

External DVI implementation

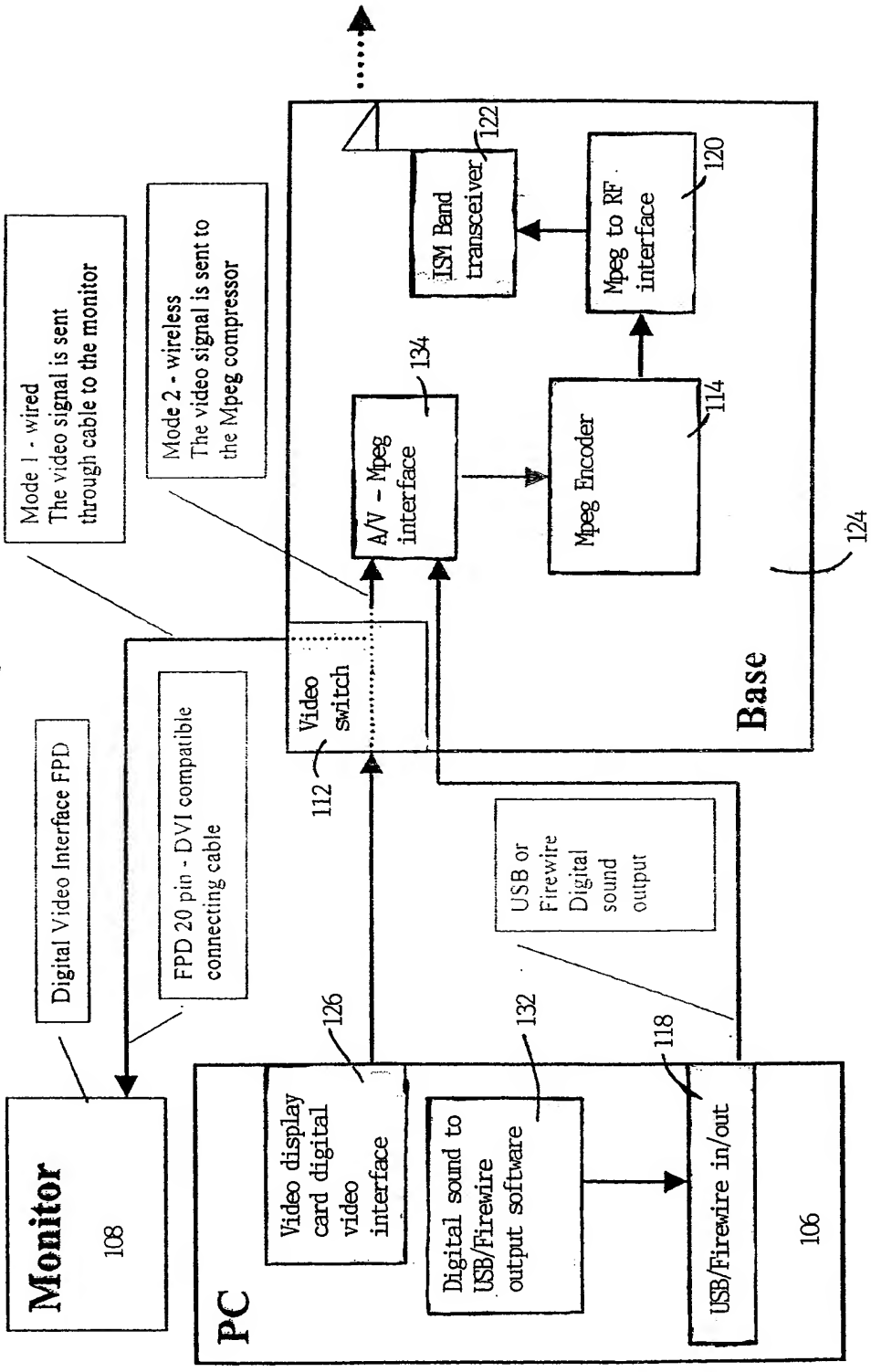

Figure 4

CORDLESS PLATFORM